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ratory. In the determination of the constants of these compounds a great deal of foundation has been laid. So far, it may be said, the facts serve quite as much to do away with false generalizations as to support true ones. Perhaps the results reach toward that borderland of residual affinity which Werner and others have been cultivating. At any rate, whatever is gained in real knowledge of halogen combination touches chemistry everywhere, on inorganic, organic and physical lines, either in elucidation or in restriction of our theories of atomic union and our views of the periodic system.

There are several papers upon perhalides of the metals in the division of 'General Inorganic Chemistry,' and several upon organic perhalides in the 'Organic Chemistry' volume. In the same relation may be included the researches upon double salts and metallic salts of the anilides, and those upon the substitution of one halogen for another in the anilides.

The article on the 'Periodic System and Inorganic Compounds' gives a much needed discussion of the thesis that 'the nature of the compounds of an element is also a function of its atomic weight,' and then goes on to report the results of very faithful experimentation upon the alums, in respect to solubilities and other features. It is to be hoped that Dr. Locke will continue his researches in this field, important as it is, and calling for a special allowance of the scientific spirit, evident in his work.

The papers in the volume on 'Organic Chemistry,' familiar as they are to chemical readers, now present a quite logical series of cognate investigations, largely upon the anilides and related imido compounds. Very few of the papers deal with compounds destitute of nitrogen. It is not too much to say that the chemical literature of the bodies just mentioned, as well as that of many formyl compounds, and a good number of imido esters, has been of late years materially enriched by these contributions. The same may be said of the literature of the esters related to carbamic acid and urea. And further experimentations upon ester derivatives of urea are ap-

pearing under the name of Professor Wheeler in the journals current since these volumes were issued.

The recent records of the chemistry of Yale are of the greater educational interest because of the early development of the science in the same institution. The account given in Volume I. of the establishment of the Sheffield Laboratory is a good bit of history rescued from the recollections of a very early chemical period. It appears that, as a university laboratory distinctly for students, it was established in 'the old President's house' from 1847 to 1860. The data are well worth saving, for the history of the laboratory method, and to help out what may be gathered from the biography of the elder Silliman, and the sketches of American chemists collected by the younger Silliman in 1876. ALBERT B. PRESCOTT.

The Foundations of Geometry. By DAVID HILBERT. Authorized translation by E. J. TOWNSEND, Ph.D., University of Illinois. Chicago, The Open Court Publishing Company. 1902. Pp. vii+132.

The merest justice calls for a pointing out of some few among the blemishes in what Professor Townsend puts forth as a translation of Hilbert's beautiful 'Festschrift.' These blemishes are the more indefensible because Professor Townsend had before him, in addition to the limpid original, the admirable French translation of L. Laugel.

To begin with, Hilbert, so studiously sparing of words, uses the word *Erklärung* nine times on his first thirteen pages.

Townsend never renders it at all. Thus Hilbert's profound and elegant distribution into definitions, conventions, assumptions and theorems is totally lost, not appearing in Townsend's translation.

In the third sentence of the introduction *Aufstellung* is translated choice, and in the fifth sentence *aufzustellen* is given as 'to choose.' In the note to the introduction, 'instructive account' is rendered 'explanatory report'!

In § 1, p. 3, the point is missed when *erfolgt* durch is rendered 'follows as a consequence of.'

On p. 5, in note to axioms of order (better axioms of arrangement), W. Pasch should be M. Pasch. On p. 6, first line, die Anordnung, the arrangement, is rendered 'an order of sequence.'

In II., 4, the repetition of the word 'so' destroys the statement intended.

Could there be a more pitiful bungle than that which, in the last two lines of p. 6, gives 'alle übrigen Punkte der Geraden a heissen *ausserhalb* der Strecke AB gelegen' as 'all other points are referred to the *points lying without the segment AB*.'

The translation of the important Axiom IV., 1, p. 12, is so bungled as to be worse than meaningless, actually false, as will be seen by comparing with the French translation:

Si l'on désigne par A, B deux points d'une droite a, et par A' un point de cette même droite ou bien d'une autre droite a', l'on pourra toujours, sur la droite a', d'un côté donné du point A', trouver un point et un seul B', tel que le segment AB soit congruent au segment A'B'.

On p. 13, 'emanating' is unfortunate.

On p. 15, l. 10, the angle-symbol is omitted.

On p. 17, l. 8 from below, 'so' should be 'such.'

On p. 22, theorem 16 is mistranslated, the insertion of the word 'corresponding' turning it into bathos.

But on p. 24 we have a still more ludicrous misinterpretation, which shows that Professor Townsend has not attempted to understand the book he attempts to translate. Under the heading Definitions (which should be Definition) he says: 'From this definition can be easily deduced, with the help of the axioms of groups III. and IV., all of the known properties of the circle.'

What a stupendous blunder this is we realize when we recall that thus cannot even be proved that a straight line which has a point within a circle has a point on the circle.

What Hilbert himself proves and what Townsend translates on p. 116, demonstrates that, using axioms I.-IV., we could not even show that from any point without a circle there is a tangent to the circle. Just so, without an axiom of continuity we cannot demon-

strate that a circle having a point within and a point without a second circle has a point on it.

On the same p. 24 the introduction, in l. 6 from below, of the word 'corresponding' is a childish mistranslation.

On p. 25 Professor Townsend puts in a little from Laugel, but seems to have no better luck with his French than with the German. 'This axiom gives us nothing directly concerning the existence of limiting points, or of the idea of convergence' is how he renders, 'Cet axiome ne nous dit rien sur l'existence de points limites ni sur la notion de convergence.'

But the game would not be worth the candle to go on thus through all the 132 pages.

So I choose as a fitting climax the sentence on p. 125, 'We easily see that the criterion of theorem 44 is fulfilled, and, consequently, it follows that *every regular polygon can be constructed by the drawing of straight lines and the laying off of segments*.'

From this we should suppose that Professor Townsend studied his geometry from the popular treatise of Mr. Wentworth between 1877 and 1887, which during those years contained on p. 224, Proposition XIII., § 387: 'To inscribe a regular polygon of any number of sides in a given circle.'

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SCIENTIFIC JOURNALS AND ARTICLES.

The Journal of Physical Chemistry. March. 'On the Relative Velocities of the Ions in Solutions of Silver Nitrate in Pyridin and Acetonitril,' by Herman Schlundt. The ionic velocities found are considerably lower than in water, but this difference seems to decrease with increasing dilution. 'On the Inversion of Zinc Sulfate, II.,' by H. T. Barnes and H. L. Cooke. 'Synthetic Analysis of Solid Phases,' by Wilder D. Bancroft. Description of a new method, applicable to alloys, efflorescent substances, basic salts, and double salts which are decomposed by the pure solvent, where the solid phase cannot be conveniently isolated in a pure state. 'A Derivation of the